

# PATENT SPECIFICATION

341,548



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Complete Left: July 16, 1930.

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## PROVISIONAL SPECIFICATION.

### Improvements relating to Automatic Fire Alarms.

I, JOHN NICHOLSON, of 5, Oakdale Terrace, Chester-le-Street, in the County of Durham, a British subject, do hereby declare the nature of this invention to be as follows:—

This invention relates to automatic fire alarms of the kind in which a capsule or similar heat-sensitive device is employed in conjunction with an electric switch to close the circuit of an alarm when the surrounding temperature rises beyond the safety limit, and has for its object to provide an improved construction.

An automatic fire alarm in accordance with my invention comprises a box or casing in which are mounted an adjustable contact, a complementary contact carried by a member supported by a spring whereby a gap is normally maintained between said contacts, and a capsule or like heat-sensitive device coacting with said spring-supported member whereby, when a rise of temperature causes said capsule to expand, said member is depressed and the contacts are moved together to close the alarm circuit. The spring-supported member comprises an arm pivoted at one end and fitted with a contact at the other, said arm bearing on a leaf or other suitable spring disposed beneath it and being fitted with an upstanding pin on which the underside of the capsule bears.

According to one construction, I provide a box of insulating material having a perforated cover. In the base of the box at one side is a fork in which is pivoted a transverse arm carrying at its other end a contact which coacts with an adjustable contact mounted in the base. A leaf spring is disposed below said arm near its contact, and presses the arm upwards. A pivoted upstanding pin is mounted at the centre of the arm, the upper end of said pin being received in a central recess in the under face of a capsule mounted in the cover of the box. The base of the box

may be closed by a plate having a central hole surrounded by a felt or like washer through which said pin works, said plate excluding dust from the box and protecting its interior. The adjustable contact in the base is mounted on or is in one with a threaded pin on which is fixed a disc. A portion of the periphery of said disc projects through an aperture in the side of the box, the edge of the disc being serrated or toothed so that the disc can be revolved either directly or through a small pinion. The disc is marked with a scale which can be read with reference to a mark on the side of the box. By revolving the disc, the contact can be caused to approach towards or recede from the contact on the spring-supported arm to vary the gap between the contacts, and the amount of expansion of the capsule necessary to bring the contacts together, and hence the temperature at which the device operates, the adjustment provided by this arrangement being very accurate and delicate so that the device can be set to automatically operate immediately the surrounding temperature reaches any predetermined degree on the thermometric scale, the adjustment being independent of the capsule.

For testing purposes, a spring-pressed button is provided in the side of the base, said button carrying a wedge-shaped conductor positioned so as to enter between the contacts and bridge the gap between them.

The leads of the alarm circuit are connected to the fork in which the spring-supported arm is pivoted and to the adjustable contact.

Dated this 19th day of October, 1929.

MEWBURN, ELLIS & Co.,

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and  
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## COMPLETE SPECIFICATION.

### Improvements relating to Automatic Fire Alarms.

I, JOHN NICHOLSON, of 5, Oakdale Terrace, Chester-le-Street, in the County of Durham, a British subject, do hereby declare the nature of this invention and

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in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

5 This invention relates to automatic fire alarms or thermal switches of the kind in which a capsule or other heat-sensitive device is employed in conjunction with an electric switch to close the circuit of an alarm or other device when the surrounding temperature rises beyond the safety limit, and comprising a box or casing in which are mounted an adjustable contact, a complementary contact carried by a member associated with a spring whereby a gap is normally maintained between said contacts, and a capsule or other heat-sensitive device coacting with the said spring member whereby, when a rise of temperature causes said capsule to expand, said member is actuated and the contacts are moved together to close the alarm circuit. The object of my invention is to provide an improved construction.

25 An automatic fire alarm or thermal switch in accordance with my invention comprises a box or casing in which are mounted an adjustable contact, a complementary contact carried at the free end of an arm pivoted at its other end, said arm co-acting with a spring whereby a gap is normally maintained between said contacts, and a capsule or other heat-sensitive device coacting with the said arm whereby, when a rise of temperature causes said capsule to expand, said arm is actuated and the contacts are moved together to close the circuit, the whole forming a unit which can be disposed where desired.

40 I will more fully describe my invention with reference to the accompanying drawings which illustrate one construction of fire alarm in accordance therewith intended for overhead fitment. In the drawings, Figure 1 is a plan view, Figure 2 a central vertical section, and Figure 3 an underside plan with the cover and capsule removed.

Referring to the said drawings, the example therein illustrated comprises a box *a* having a removable cover *b*. Within the box is mounted a base *c* of insulating material which supports at one side a fork *d* in which is pivoted one end of a transverse arm *e* carrying at its free end a contact *f* which coacts with an adjustable contact *g*. A spring *h* is disposed between the base *c* and a recessed block *j* pivoted at the centre of the arm *e*, said spring pressing the arm downwards. An adjustable screw (not shown) is provided to press on the spring *h* to compress it and increase its load as may be required. A pin *k* is carried by the block *j*, the lower end of said pin being received in a central

depression *m* in the upper face of a capsule *n* which is placed within the cover *b* of the box. If desired, a plate (not shown) having a central hole surrounded by a felt or like washer through which the pin *k* works may be mounted above the capsule *n* to exclude dust from the box *a* and protect its interior. The adjustable contact is carried by a member *p* pivoted in a fork *q* on the base *c* and raised by a spring *p'* disposed between its tail and the plate *c*. The lower end of a screw *r* bears on the fore portion of the member *p*. The head of the screw comprises a disc *s*, a portion of the periphery of which protrudes through an aperture in the side of the box *a*, the edge of said disc being serrated or toothed so that the disc can be revolved either directly or through a small pinion (not shown). The disc is marked with a scale which can be read with reference to a mark on the side of the box. By revolving the disc, the screw *r* can be projected or withdrawn and the member *p* moved against the spring *p'* to cause the contact *g* to approach towards or recede from the contact *f* on the arm *e* and vary the gap between the contacts and hence the amount of expansion of the capsule *n* which will bring the contacts together and the temperature at which the device operates, the adjustment provided by this arrangement being very accurate and delicate so that the device can be set to automatically operate immediately the surrounding temperature exceeds any predetermined degree on the thermometric scale, the adjustment being independent of the capsule.

The leads of the alarm circuit are connected to the terminals *t* and *u* which are connected by the plates *v* and *w* to the forks *d* and *g* respectively.

For testing purposes, a spring-pressed button *x* is provided in the side of the box *a*, said button having a head *y* coacting with a spring contact *z* connected to the terminal *t* so that when the button *x* is pressed in, the contact *z* is forced against a complementary contact *2* connected to the terminal *u*, the testing being thus accomplished without affecting the setting of the contacts *f* and *g* or the spring *h*.

It will be understood that a leaf or any other suitable spring may be substituted for the coil spring *h* illustrated, and that any other forms of heat-sensitive device, for example a bimetallic strip, may be employed in place of the capsule *n*, the type of said device depending on the temperature at which the alarm is intended to become operative.

For use in oil, gas or other fluids, the box *a* may be made liquid or gas proof, and the adjusting screw *r* led out through

a gland and fitted with the disc outside of the box, the leads to the alarm circuit being enclosed in a flexible tube. Gauze covers may be provided for eliminating any risk of explosion due to sparking at the contacts.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. An automatic fire alarm or thermal switch of the kind herein referred to comprising a box or casing in which are mounted an adjustable contact, a complementary contact carried at the free end of an arm pivoted at its other end, said arm coacting with a spring whereby a gap is normally maintained between said contacts, and a capsule or other heat-sensitive device coacting with the said arm whereby when a rise of temperature causes said capsule to expand, said arm is actuated and the contacts are moved together to close the circuit, the whole forming a unit which can be disposed where desired, substantially as herein described.

2. An alarm or switch as claimed in claim 1 provided with a disc on a screw for adjusting the gap between the contacts, substantially as herein described. 30

3. An alarm or switch as claimed in claim 1 or 2 provided with a spring-pressed button for testing purposes adapted to operate without affecting the setting of the contacts, substantially as herein described. 35

4. The improved automatic fire alarm or thermal switch constructed, arranged and adapted to operate substantially as and for the purposes herein described with reference to the accompanying drawings, and subject to the modifications herein referred to. 40

Dated this 16th day of July, 1930.

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Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1931

[This Drawing is a reproduction of the Original on a reduced scale.]

FIG. 1.

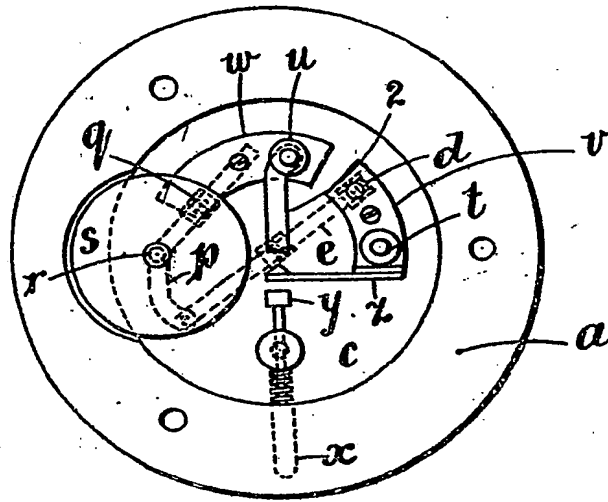


FIG. 2.

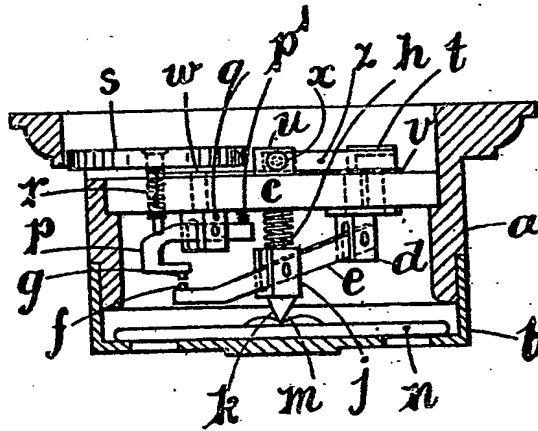
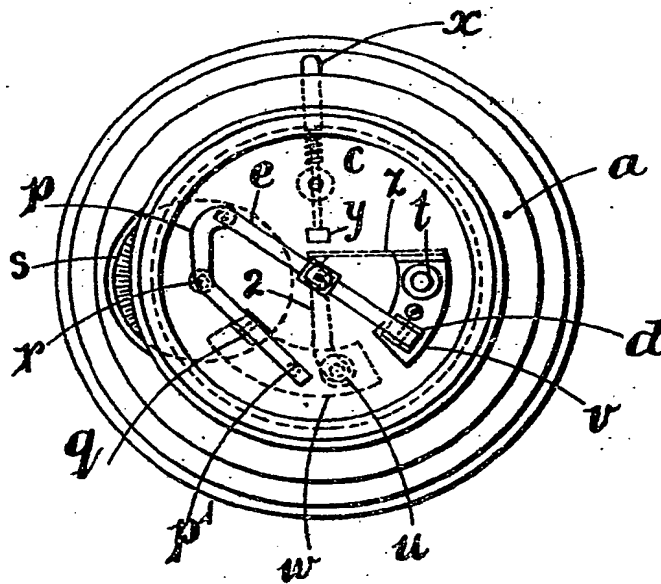


FIG. 3.



Charles & Read Ltd. Photo Litho.